



Commodore's PET is one of the very few personal computers that combines all four basic units (keyboard, computer, cassette drive, video output) in a single package.

6502 Microprocessor

Commodore uses the MOS Technology 6502 (made by one of their subsidiaries), which has a very awkward instruction set. This means that the USR(X) function is more difficult to use than is true for most eight-bit microprocessors. This difficulty is obvious only with the USR function. In program execution, the PET is at least as fast as any other microcomputers which I have tried.

Deficiencies

The PET is a great machine, but it has some deficiencies in addition to the short screen line (40 characters) and the small keyboard. Some of these

could have been overcome at almost no additional production cost but were overlooked by Commodore. Among these deficiencies are:

1. There is no composite-video signal available to the user. This means that a teacher who wants to use the computer in his/her classroom cannot display the screen on a monitor. Marc Hertzberg in our lab at Stony Brook has designed a system modification which provides this signal and which costs about \$3 worth of parts and may be installed in less than half an hour.

2. There is no handle on the PET. I put on a \$1 hardware-store handle and take my PET everywhere. Actually, none of the microcomputer manufac-

turers has put on a handle. Incidentally, the PET weighs 44 pounds, which is a bit heavy. Twenty pounds is a good weight goal.

3. We have a small number (three or four) of system crashes a month on each of our three PETs. We haven't been able to pinpoint the cause but suspect that line spikes are getting through the power supply. Fortunately, because BASIC is in ROM, we can recover by turning the machine off and then on again. Of course, in the process we lose whatever was in RAM. It would be nice to have a system restart mechanism which doesn't zero the memory.

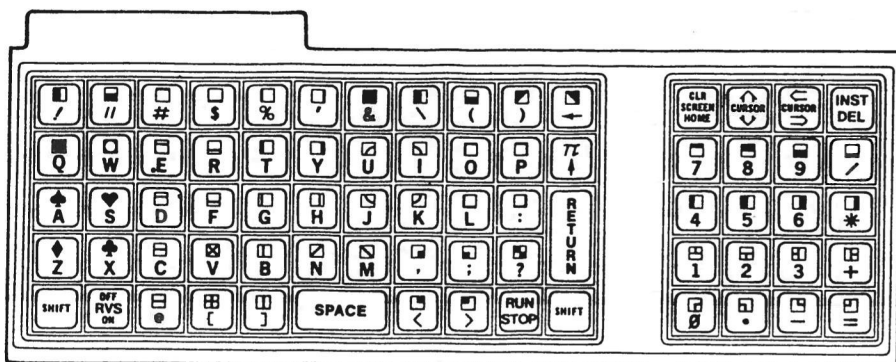
4. The cassette recorder doesn't have a counter, which is a real nuisance. If you have several programs on one tape, it is impossible to fast-forward to a point near the beginning of the program before loading. This means that you must start at the beginning of the tape and let it run at regular speed until it finds and loads your program.

5. The advertised transfer rate on the cassette recorder is 1000 baud. The effective transfer rate is closer to 250 baud because of overhead in the file format (leader space, redundancy, etc.). This, combined with (4) above, means that you must put only a small number of programs on a cassette or wait perhaps several minutes to get a program loaded. Arthur Leuhrmann of the Lawrence Hall of Science has solved this problem by using C5 cassettes and recording only one program per cassette.

6. Probably the most inexcusable deficiency in the PET is the sad state of the user's manual. When we got our first PET in October, we got a small booklet which told us how to turn the PET on, how to save and load programs, and which merely listed all the BASIC commands. Our second and third PETs arrived in December with a slightly larger booklet. This one gave brief illustrations of most of the commands and a little trouble-shooting information but still was inadequate. In January, we got about 50 loose-leaf pages describing the BASIC commands in adequate detail. With patience, I suppose that we eventually will get a real manual.

7. Another possible problem with the PET, at least for school administrators, is a lack of approval by Underwriters Laboratories. This doesn't mean that the machine is unsafe, but it is a base which Commodore should touch as soon as possible.

8. Additional memory is expensive. At a time when good 16K RAM boards sell for less than \$400, charging \$200 for 4K of RAM is hard to take. Additional RAM, beyond 8K, must be placed outside the main cabinet, which



Since each of the 64 graphics characters can be displayed in white on black or in black on white, 128 graphic symbols are available, including the four playing-card symbols.